

**DETAILED ACTION**  
**EXAMINER'S AMENDMENT**

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Justin Leach on 15 March 2009.

The application has been amended as follows:

**In the Claims:**

Claim 1, line 1, after "an ablative rocket", delete --nozzle--, insert --exhaust assembly--

Claim 1, line 2, after "the ablative rocket", delete --nozzle--, insert --exhaust assembly--

Claim 2, line 1, after "the ablative rocket", delete --nozzle--, insert --exhaust assembly--

Claim 3, line 1, after "the ablative rocket", delete --nozzle--, insert --exhaust assembly--

Claim 4, line 1, after "the ablative rocket", delete --nozzle--, insert --exhaust assembly--

Claim 5, line 1, after "the ablative rocket", delete --nozzle--, insert --exhaust assembly--

Claim 6, line 1, after "the ablative rocket", delete --nozzle--, insert --exhaust assembly--

Claim 7, line 1, after "the ablative rocket", delete --nozzle--, insert --exhaust assembly--

Claim 8, line 1, after "the ablative rocket", delete --nozzle--, insert --exhaust assembly--

Claim 9, line 1, after "the ablative rocket", delete --nozzle--, insert --exhaust assembly--

Claim 13, line 1, after "the ablative rocket", delete --nozzle--, insert --exhaust assembly--

Claim 14, line 1, after "the ablative rocket", delete --nozzle--, insert --exhaust assembly--

Claim 15, line 1, after "the ablative rocket", delete --nozzle--, insert --exhaust assembly--

Claim 16, line 1, after "An ablative rocket", delete --nozzle--, insert --exhaust assembly--

Claim 16, line 2, after "the ablative rocket", delete --nozzle--, insert --exhaust assembly--

Claim 16, line 11, after "composite sub-assembly to provide", delete --the--, insert --an--

Claim 17, line 1, after "the ablative rocket", delete --nozzle--, insert --exhaust assembly--

Claim 18, line 1, after "the ablative rocket", delete --nozzle--, insert --exhaust assembly—

Claim 19, line 1, after "the ablative rocket", delete --nozzle--, insert --exhaust assembly—

Claim 21, line 1, after "the ablative rocket", delete --nozzle--, insert --exhaust assembly—

Claim 29, line 1, after "the ablative rocket", delete --nozzle--, insert --exhaust assembly—

Claim 29, line 2, after "proximate a first axial", insert --opening—

Claim 29, line 3, after "of axial opening", delete --opening--, insert --openings—

Claim 30, line 1, after "the ablative rocket", delete --nozzle--, insert --exhaust assembly—

Claim 31, line 1, after "the ablative rocket", delete --nozzle--, insert --exhaust assembly—

***Allowable Subject Matter***

2. Claims 1-9, 13-19, 21, 29-31 are allowed.
3. The following is an examiner's statement of reasons for allowance: The limitations "An ablative rocket exhaust assembly... comprising a first ablative composite sub-assembly and a second ablative composite sub-assembly; and a plurality of radial openings... a plurality of axial openings... a second plurality of axial openings... a film adhesive disposed between the first ablative composite sub-assembly and said second ablative composite sub-assembly... including a third plurality of openings

therethrough..." found in claim 1 and "An ablative rocket exhaust assembly... comprising a first ablative composite sub-assembly and a second ablative composite sub-assembly... a film adhesive disposed between said first ablative composite sub-assembly and said second ablative composite sub-assembly... a first plurality of openings... a second plurality of openings... includes a third plurality of openings..." is not taught or disclosed in any prior art of record. The closest prior arts of record Emerson US 3,418,707 and Woessner et al. US 6,951,317 B2 do not teach or disclose all claim limitations. Emerson discloses a method of manufacturing a rocket nozzle where the rocket nozzle comprises ablative sections which are bonded to form an ablative nozzle. The nozzle is not explicitly taught to be held together with a film adhesive; however, the largest discrepancy is that Emerson does not disclose any openings, radially or axially, in the ablative assembly. Woessner et al. teaches a pneumatic pilot valve for a rocket nozzle in a missile that includes several openings for attitude adjustment control. Woessner does disclose an ablative component; however, the ablative component is a single sectional piece. One of ordinary skill in the art at the time of the invention would not have found it obvious to combine the Emerson reference with Woessner reference to arrive at the Applicant's claimed invention because the properties of an ablative structure would drastically change the intended function of the radial outlets of the Woessner reference. It is well known in the art that rocket exhaust assembly geometry affects the efficiency of the engine (i.e. thrust output) where the inclusion of an ablative nozzle assembly into the Woessner reference would drastically effect the nozzle geometry in an unobvious and possibly undesirable manner.

Furthermore, the inclusion of axial and/or radial openings in the Emerson reference would have altered the intended function of the ablative rocket assembly in a unobvious manner. Antecedent support for the limitation "ablative rocket exhaust assembly" is provided, in part, by Applicants' originally submitted claims 1-15, which each recited "an ablative composite assembly." Antecedent support for the phrase "ablative rocket exhaust assembly," and specifically for the phrase "rocket exhaust," may also be found throughout the Application's Specification. See, for example, Applicants' Abstract stating that embodiments of the invention relate to ablative composite sub-assemblies capable of withstanding "the high temperatures (5000 degrees Fahrenheit) encountered in hot gas rocket exhausts"; Applicants' Paragraphs 0008-0009 generally explaining that the embodiments of Applications' invention represent an improvement over conventional exhaust valves used in applications such as for tactical missiles, [which] use inexpensive lightweight ablative composites for their construction" and which "have the disadvantage that they are prone to degrade at extremely high temperatures (Greater than 5000 degrees Fahrenheit)"; Applicant's Paragraph 0052 noting that "[t]he film adhesive 32 does not erode at the high temperatures (5000 degrees Fahrenheit encountered in hot gas rocket exhausts."

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Contact Information***

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to GERALD L. SUNG whose telephone number is (571)270-3765. The examiner can normally be reached on M-F 9am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cuff can be reached on (571) 272-6778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Gerald Sung  
Patent Examiner  
GS  
12 March 2009

/Michael Cuff/

Supervisory Patent Examiner, Art Unit 3741